

REMARKS

Claims 9, 13-16 and 18-22 are pending in the application. Claims 9, 13-16 and 18-22 are rejected.

Claim Rejections - 35 U.S.C. §103

Claims 9, 13-15 and 19-22 are rejected under 35 U.S.C. §103(a) as being unpatentable over Horikoshi et al. in U.S. Patent No. 6,194,115 further in view of JP 5-107805 and the admitted art. The Examiner concludes that it would have been obvious to produce the toner of Horikoshi et al. with minimal amounts of low molecular weight components (e.g., oligomers having a molecular weight of less than 1,500, unreacted polyester-forming acids, residual benzene from charge control agents) because the art teaches that oligomers and acids from the polyester binder resin give detrimental effects to the toner as well as producing undesirable odor.

Claim 16 is rejected under 35 U.S.C. §103(a) as being unpatentable over Horikoshi et al. in U.S. Patent No. 5,618,648 in view of Nagase et al. in U.S. Patent No. 6,194,115 further in view of JP 5-107805 and the admitted art as applied to claims 9, 13-15, 19, 20 and 21 above, and still further in view of Inaba et al. in U.S. Patent No. 5,741,617. The Examiner notes that Horikoshi et al., Nagase et al., the admitted art, and the JP document do not disclose the specific compound given by the formula in dependent claim 16, however, asserts that Inaba et al. discloses a wax composition containing ester waxes such as Ester Compound No. 4 (col. 8) as a toner additive. The Examiner concludes that it would have been obvious to use the exemplified ester wax on Inaba in the invention of Horikoshi et al. because Horikoshi et al. discloses that

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waxes may be usefully included in the flash fixing toner and Inaba discloses waxes that aid in fixing of toner images.

Claim 18 is rejected under 35 U.S.C. §103(a) as being unpatentable over Horikoshi et al. in view of Nagase et al. further in view of JP 5-107805 and the admitted art as applied to claims 9, 13-15, 19, 20 and 21 above, and still further in view of *Handbook of Imaging Materials to Diamond*, pp. 201-202. The Examiner notes that Horikoshi et al., Nagase et al., the admitted art, and the JP document do not disclose the size of the carrier in the developer. The Examiner notes that *Diamond* states that the carrier particle is usually 3 to 50 times larger than the toner, which is typically about 12 μm in diameter. The Examiner concludes that it would have been obvious to produce the carrier of Horikoshi et al. with a size of about 36 μm because *Diamond* states that a typical toner size is 12 μm and that carrier sizes can be 3 times that size. Because the value of 12 μm falls within the disclosed range of Horikoshi et al. such a size for the toner would also have been obvious.

Applicants note that, as described on page 5, line 1 to page 6, line 7 of the specification, the invention is directed to the important characteristic of reducing the total weight of the components in the toner having a molecular weight of 500 to 1500. The present invention is characterized in controlling the total weight of the 500 to 1500 molecular weight components in the toner. This particular limitation of the present invention is neither taught nor suggested by the cited references.

Applicants respectfully disagree with the Examiner's characterization of Horikoshi et al. The Examiner asserts that one skilled in the art, upon reading Horikoshi et al., would find it

obvious to use minimal amounts of low molecular weight components. However, Applicants note that Horikoshi et al. specifically states that,

“...as one of the important characteristics of the toner for flash fixing, the binder resin constituting the toner must melt rapidly in the course of fixing to paper and the like and after it is cooled and solidified, should show good fixation. In order to obtain such a toner property, **a polymer having a low molecular weight** and a low melt viscosity, generally called an oligomer (for example, having a number average molecular weight M_n of less than 1500 and a weight average molecular weight M_w of 10,000 or less) **is widely used.**”

(Column 2, lines 45-67). In other words, Horikoshi et al. teaches that it is **necessary** to use a low molecular weight polymer in a toner. Applicants note that Horikoshi et al. recites various problems that are associated with the use of low molecular weight polymers, but there is no suggestion that it is generally possible to limit the amount of low molecular weight components in the toner, particularly in the claimed ranges. Even after noting the problems associated with the use of low molecular weight components, Horikoshi et al. does not suggest restricting the components having the claimed range of molecular weights. Rather, Horikoshi et al. teaches and suggests to one skilled in the art that it is possible to use low molecular weight components and avoid problems generally associated with low molecular weight components by using components that ensure a high glass transition temperature, rather than restricting components having particular molecular weights, as claimed.

Applicants also note that Horikoshi et al. suggest that the toner binder can be a toner binder having a number average molecular weight of 5,000 or less, a peak molecular weight of

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3,000 or more, and a weight average molecular weight of from 20,000 to 200,000. However, Horikoshi et al. does not appear to teach or suggest **restricting** the components of the toner that have molecular weights in the range of 500 to 1000, as claimed in the present invention.

As noted above, the Examiner concludes that it would have been obvious to produce the toner of Horikoshi et al. with minimal amounts of low molecular weight components, including unreacted polyester-forming acids and residual benzene from charge control agents. With respect to the Examiner's example of unreacted polyester-forming acids, Applicants note that Horikoshi et al. cites succinic acid (column 5, line 67) and aliphatic dicarboxylic acid (column 6, lines 47-48) and the like as its examples of unreacted polyester-forming acid, which are clearly not within the claimed molecular weight range of 500 to 1500. Similarly, neither is residual benzene from charge control agents in the claimed molecular weight range of 500 to 1500.

For at least the foregoing reasons, Applicant submits that the claimed invention as herein amended distinguishes over the cited art and defines patentable subject matter. Favorable reconsideration is earnestly solicited.

Should the Examiner deem that any further action by Applicants would be desirable to place the application in condition for allowance, the Examiner is encouraged to telephone Applicants' undersigned attorney to arrange an interview.

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In the event that this paper is not timely filed, Applicant respectfully petitions for an appropriate extension of time. The fees for such an extension or any other fees that may be due with respect to this paper may be charged to Deposit Account No. 50-2866.

Respectfully Submitted,

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